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PINOT NOIR IN THE OLTREPÒ PAVESE:
AREA OF DIFFUSION AND ECONOMICAL ASPECTS

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INTRODUCTION

The Oltrepò Pavese

The Oltrepò Pavese covers an area of approximately 1,100 km² and is found in northwestern Italy on the northern slopes of the Apennine chain. It is in the Province of Pavia, the southernmost tip of the region of Lombardy. To the west it borders with Piedmont, to the east with the Emilia Romagna, and extends south as far as Liguria. The entire area is divided into three fairly homogeneous areas of plains, hills and mountains that follow each other in succession down the river Po to the north to the Apennines to the south.

The altitude varies from 110 m a.s.l. to over the 1,700 m of the highest mountains. The area dedicated to specialized wine growing lies between 120 and 500 m a.s.l. The largest population is to be found in the hill areas (a few hundred inhabitants per km²). Fewer people live on the plains while far fewer again live in the mountainous areas (from 10-30 up to 100 inhabitants per km²) (ROSA, 1988). Wine growing is the most important activity in the hills of the Oltrepò Pavese from both an economical and a socio-cultural point of view. The number of people working in this sector has, in recent decades, been subject to much variation. Wine growers tend to be older (on average 55-60 years old) and, with the passing of time, more and more of the land that is more difficult to cultivate is being abandoned.

The story of wine growing in this area covers thousands of years. Fossil findings confirm that grapevines were to be found in the hills of the Oltrepò before the arrival of Man. Initially, the grapevines were eaten fresh from the grapevines and it was only in the thousand years before the birth of Christ that wine started to be produced.

According to the works of Polibio, Strabone and Tito Livio, it is thought that the Ligurian people, who in prehistoric times lived in the areas from Marseille to Piacenza, made wine from grapevines (SCHICK, 1955; DALMASSO, 1931). Under the influence of the Greek colonies in Spina (according to commercial documents at the mouth of the river Po) and in Marseille, and the Greek settlements in the region that today makes up Liguria, wine growing was characterized by the use of adapted low training systems with 'dead' support (canes or poles), in contrast to the Etruscan-Italic tradition of expansive grapevine training on 'live' supports (trees) (SERENI, 1964). The Oltrepò Pavese is part of the important wine growing area that the Romans called Gallia Cisalpina, i.e. the area that runs from the Italian side of the French Alps down to a line between Pisa on the Tyrrhenian Sea to Rimini on the Adriatic. It was from here that the Romans launched their invasion of northwestern Europe. Darker times came during the invasion of the barbarian hordes that followed the fall of the Roman Empire. In those years, it was the monasteries in the area that safeguarded the wine growing tradition and its culture. In the 16th century, grapevines were cultivated in an area that extended for approximately 3,000 ha and in the 19th century, once the wars fought in the area were over (often over border issues), typical specialized cultivation covered approximately 15,000 ha of hill area. Today, there are almost 16,000 wine producers in the Oltrepò Pavese with 65,000 ha of agricultural land (covering 91 municipalities). Of these, 8,900 wine producers are to be found in the 42 town councils that enjoy

the denomination DOC (*Denominazione di Origine Controllata*, i.e. Italian *appellation*-based regulation). The agricultural land used in the DOC areas covers approximately 19,000 ha of which 75% are dedicated to grapevine cultivation (94% of farms). Approximately 94% of farms in the DOC area cultivate grapevines (ROSA, 1988).

Total wine production is around 900,000 hl of which 41% is DOC. The local climate is mainly continental since the influence of the mild conditions of the Tyrrhenian Sea are blocked by the Apennine mountain chain. There is a wide annual thermal range (35 to 40°C in summer to -12 to -20°C in winter). With approximately 700-800 mm yearly rainfall, mostly concentrated in spring and autumn. Summers are dry with some winter snowfall (FREGONI, 1979). The orographic profile of the wine growing area is defined by four main valleys that run approximately north-south with numerous smaller valleys such as to create a high number of microenvironments (also quite steep), each with its own wine growing characteristics. This suggests that different areas could be identified by the *cru* produced there. The terrains, for the most part originating from the Miocene and Eocene periods, are characterized by high quantities of clay and frequently substantial or high quantities of lime. However, there is a great variety of soils in the area. The grapevine varieties used to produce red wine, mainly concentrated on the lower hill slopes or nearer the Po Valley, are Barbera (originally from Piedmont), Croatina and Uva Rara (that are considered local species). Today, some wine growers use smaller quantities (5-10%) of Pinot Noir for red wines.

The varieties Pinot Noir, Riesling, Pinot Gris, Pinot Blanc and Chardonnay (in descending order) are used to produce white wines. The most used rootstocks are 420 A and Kober 5BB, even though, over the last decade, other genotypes have been used, such as SO4 and 1103 P. The most frequent cultivation techniques are the Guyot training system with 2 canes and planting patterns of 2.5 m between the rows and 2 m between vines in the row. The training systems Casarsa and GDC are only found in some areas; about the Guyot system, there is a tendency to increase planting density. The technique most used for soil management is the use of mechanical hoeing machines and diggers (2-4 times a year). Little weeding is carried out (and if so, the soil is almost never completely weeded), and there is little use of grassing over, even though the soil-type and climate could require these techniques to be adopted (ZAMBONI, 1988). Anti-parasite treatments are mainly concentrated on the classical cryptogams: *Peronospora*, *Oidio*, *Botrytis* (the latter not always dangerous in this climate).

Treatment against phytophagans is seldom used. Also, soil disinfestation is not usually carried out. There has been a worrying increase in esca disease of the grapevine and of wood diseases in general. Over approximately 3,500 ha, treatments against cryptogams are sprayed from helicopters from the nine helicopter consortiums that have been working in the area for over twenty years (VERCESI, 1987).

The Greek geographer Strabone, who lived around the time of the birth of Christ, made an important observation concerning the history of wine production in the Oltrepò Pavese. He described the use of big barrels to make the local wines. Perhaps the Oltrepò was the first area in Italy, and possibly even in Europe, to use wood and not terracotta to make wine. Today, the technology used in wine production is quite advanced and among the newcomers there are the *novelli* (young) wines produced from grapevines of the same year by carbonic maceration and the first red wines matured in *barrique*. Altogether, the wines produced are of a good overall quality. However, above all some white wines and sparkling wines, and some red wines are of high quality.

Over the last centuries and even today, marketing of wines of the Oltrepò Pavese is mainly directed towards Milan, one of the biggest wine markets in the world. The figure of the small salesman who sells his own wine in demi-johns or in bottles directly to the consumer is very common, alongside medium and medium-large marketing organizations (MAFFI, 1988). Approximately 50% of the grapevines produced are taken to the local co-operative wine growers' associations. These were set

up at the beginning of the 20th century and in the 1980s played an important role in improving the quality of the wine. They have thus responded to the demand for bottled wines of increasingly higher quality and the need to improve marketing strategies. The local co-operative wine growers' associations have also filled the gap left by the progressive cuts in public sector spending, even though radical changes will probably be made over the next few years. Overall there are some excellent and positive trends.

Pinot Noir

The pinots (Noir, White, Gris, etc.) are a group of grapevine varieties considered to be genetically derived from Pinot Noir. Some of their characteristics (rounded leaves) and behaviors (easily mutated) could indicate a probable direct archaic derivation. Some of the great Roman ampelographers (Catone the Censor, Lucio Giunio Moderato Columella, Celsio) describe grapevines and wines with characteristics very similar to those of the present day Pinots (DALMASSO, 1931; CALZECCHI, 1948). Probably the progenitors of these varieties of vine were already to be found before grapevines were cultivated in Burgundy and in Marna (GALTIER, 1951) and were taken there during the Roman invasions that began in the 1st century B.C., given the well known agricultural and wine growing practices of the Roman occupation. The modern Pinots that are cultivated worldwide originate from the French area of Burgundy.

It is in Burgundy and Champagne that Pinot Noir has reached its maximum expression. It is very likely that the French Pinot Noir was introduced to the Oltrepò Pavese and the northern Apennine viticultural area, around the mid-19th century. Its production has continued to grow, mainly in the Oltrepò Pavese, and above all in the last twenty years. The first sparkling wines were produced in the area in 1870 (MAFFI, 1980).

The grapevines have a large variety of different morphological characteristics according to biotype or clone. Pinot Noir, with a small cylindrical-conical cluster, has a mainly tri-lobes leaf. In fact, there are no or very few lower leaf lower sinus. The leaf margin has showed large based teeth. The petiole sinus is V- or U-shaped. The grape cluster is small or medium-large. There are large differences in the size of grapes between French and German-Swiss genotypes, the latter being larger. The grapevine berry is of medium size, rounded and slightly oval, and blue-black in color. It has average shooting and flowering. The veraison is early and grapevines mature in the second period, beginning-mid September. Grapevine grapes grow on the shoots proximal to the old wood (first, second node) and there is substantial or high vigorous growth.

There are biotypes of the Pinot Noir that can be used to produce white wines and sparkling wines that are robust and perfumed and that maintain their characteristics over time (it is the principal species of wine used to make quality sparkling wines) as well as high alcoholic grade red wines with a rounded and pleasing taste, very suitable for maturing in wood (above all in small barrels). Perhaps it could be said that the best red and sparkling wines in the world are also obtained with this variety of vine. Thanks to its particular characteristics it can also be used to improve wines made from different varieties of grapevine.

AIM OF THE RESEARCH

The aim of the studies carried out is to widen our knowledge of the market in Pinot Noir produced in the Oltrepò Pavese. An analysis of this context led us to compare the different behaviors of the farms and producers in terms of the choice of the type of product to put on the market. In fact, the grapevine producers can choose which product to cultivate as part of the production strategy beginning with the grapevine, right up to the valuable bottle of matured wine or wine processed in various ways. Between these two extremes there is quite a wide range of the possibilities. An

important variable that has an impact in deciding the different phases from one stage to another is the added value.

Today, the economic definition of this parameter is also strongly considered in terms of financial, fiscal, and social mechanisms. This definition states that if goods have a value (that could be related to the market or to its usefulness or to the amount of work and energy used to obtain it, on the basis of the type of economic choices considered and of the category to which it belongs) their value can be increased, can grow or can be added by artificial means such as technological-productive, packaging and commercial-distribution. Therefore, in trying to identify products with intermediate added value, all originating mainly from the Pinot Noir grapevine, the research has subsequently compared them in order to verify possible points of excellence to insert in the multi-stage process.

MATERIALS AND METHODS

The research considered a series of farms and grapevine producers from among those that best represent processing of the Pinot grapevine in the Oltrepò Pavese. Some of these are private enterprises that process grapevines of their own production or bought from others, while others are associations that function as co-operatives. Through 1989, a 28-point questionnaire divided in different sections was completed by the technical-administrative managers of the different enterprises chosen. From this, information was collected about the enological structures and the area of land covered by grapevines of the farm, the quantification and specification of purchases and sales of Pinot grapevines, and also of the wines made from them. A selection of farms and grapevine producers considered to represent a more specialized viticulture, in particular regards to sparkling wines, were also examined in order to better quantify the diffusion of the variety under study and its presence in the Oltrepò Pavese with respect to the other grapevine species cultivated there. The questionnaire revealed an overview of the farms and grapevine growers and of the different product strategies adopted. All information was registered as anonymous because of privacy considerations. In this way, information was collected on the years of viticulture 1987 and 1988.

RESULTS AND DISCUSSION

The initial idea of the research referred in particular to Pinot Noir, but we realized that in any discussion of sparkling wines it was difficult to only talk about a single entity. Therefore, we tried to estimate its incidence (percentage) by evaluating the economic significance of the various phases of processing together with Pinot Blanc, Pinot Gris and Chardonnay. Further consideration was given to the confidentiality of some data on the impact of costs in the various phases of transformation. Probably, in the cases examined, a complete evaluation and analysis of production costs was not always available for each single product or each single process.

Estimation of the area used for Pinot Noir and trends

No recent in-depth studies have been made with regards to the worldwide distribution of Pinot Noir. We can however make general conclusions about the presence of Pinot Noir in different parts of the world from some publications or summaries reported by various authors (GALET, 1985; HILLEBRAND *et al.*, 1984; BOURSIQUOT, 1988).

Of the approximately 36,000 ha that we can estimate as used to cultivate Pinot Noir in the world (TABLE 1), approximately 60% is in France and is almost completely concentrated in the grapevine growing areas of Burgundy and Champagne. A little under half of the French Pinot Noir is to be found on the hills of Champagne and is used to produce white sparkling wines. The remainder is to be found in Burgundy, where biotypes with above all small or medium-small bunches are found. These are used to produce red wines to be matured and refined in small barrels (*barriques*).

After France come Italy and Germany with 4,000 and 3,900 ha of vineyards, respectively, of Pinot Noir. Switzerland and California come next with approximately 3,000 ha. According to Galet, Pinot Noir can also be found, although, only in small quantities, in Argentina, Chile, Uruguay, Austria, ex-Czechoslovakia, Hungary, Bulgaria, Rumania, ex-Yugoslavia, Azerbaijan and Georgia (TABLE 1).

If we consider the reports of various authors on the extension of Pinot Noir in Italy, we can say that most of the area used for this species is in the Oltrepò Pavese (Lombardy), with more than 2,500 ha (2,580 Ha in 1988) registered as D.O.C. species of wine for Pinot Noir wine (TABLES 2 and 3). Other areas are Veneto, Trentino Alto Adige, Friuli Venezia Giulia, Piedmont and Emilia Romagna.

Since it is known that Pinot Noir and Pinot Gris can be used together, above all to obtain both Pinot Nero and Pinot Grigio D.O.C. wines, we also examined approximately 30 producers spread over the area and the presence of the 2 varieties was checked and confirmed. On average, the areas of cultivation of Pinot Gris and Pinot Blanc did not exceed 15% and 5%, respectively, of the entire area dedicated to Pinots. Given this, the number of hectares covered by each of the 3 grapevine varieties was estimated. Even with these figures of reference, in some areas the 2 varieties less widespread: Pinot Gris and Pinot Blanc, together, amounted to less than 6-7% of the total of Pinots.

Of the approximately 2,700 ha registered in 1988 (all the pinots), Pinot Noir would, therefore, account for approximately 2,200 ha, while 406 and 136 Ha are estimated for Pinot Gris and Pinot Blanc, respectively (TABLE 4). Also Chardonnay has a good presence, with figures worthy of being estimated; these amount to less than 300 ha, many of which are not yet in full production.

Chardonnay has long been found in the Oltrepò Pavese and for decades has been confused with Pinot Blanc due to similar characteristics of the two varieties. There has been a certain increase in Chardonnay in recent years due to its use in production of sparkling wines, but this has now diminished also because of its great vulnerability to *Flavescence dorée*. Chardonnay has only recently been authorized as D.O.C. Table 3 shows that the area registered for D.O.C. Pinots has multiplied 3-fold from 1977 to 1988. In the same period, the overall area registered for all Pinots, D.O.C. and non-D.O.C., has almost doubled. Considering the area estimated for the Pinots, it should be noted that a substantial proportion is represented by young grapevines who have not yet reached full production or that are not yet productive.

We can, however, cautiously state that the effective extension of fully productive vineyards of all the Pinots is now between 2,300 and 2,500 ha with a potential production of approximately 23,000,000-25,000,000 kilos of grapes (in 1989 13,800,000 kilos of Pinot grapes were considered D.O.C.). In the near future, it is probable that, both because of young grapevines coming into full production and for the full maturity of other grapevines, along with the probable establishment of new vineyards with these varieties, the production potential of the area should rise to over 30,000,000 kilos of grapes. Given the current trend for Pinot Noir over other varieties of the group, the total grape production will continue to an ever greater extent to be made up of Pinot Noir.

Other varieties

In recent years, the overall production declared (C.C.I.A.A. – *Camera di Commercio Industria Artigianato Agricoltura*, the Chamber of Commerce) was approximately between 900,000 and 1,000,000 hl. This included table wines, wines of a specific geographic location and D.O.C. wines. Considering the average production reported in the last four years by the sample farm and grapevine growers in the study, it can be seen that average production *per* hectare was approximately 80 hl/ha (11,500 kilos) of red grapes and approximately 60/70 hl/ha (approximately 10,000 kilos) of grapes destined for the production of white wines and sparkling wines.

It can be estimated that approximately 14,400 ha are cultivated with specialized grapevines. These are divided into 9,150 ha (63.6%) destined for the production of red wines and approximately 5,600 ha (36.4%) destined for the production of white wines, given registered figures.

Over the last 20 years, therefore, there has been a wider cultivation of these grapevine varieties destined for the production of white wine and sparkling wines.

Outside the D.O.C. area it could be reasonable to believe that some hundreds of hectares are cultivated with specialized viticulture, above all on the northern plains; the rural centers of Barbianello, Broni, Stradella, Portalbera and Arena Po.

The use of the D.O.C. on wine labels is not particularly widespread and the percentage of wine sold as D.O.C. is around approximately 40%. It should, however, be noted that adoption of the D.O.C. denomination has substantially increased in recent years; in 1983 only 25% of the wine produced was sold as D.O.C.

The variety that is most cultivated today, rather more widespread in the vineyards in the western part of the area, is still Barbera (33% of the area cultivated). This percentage reflects the provisions set out in the regulations of the D.O.C. denomination in the Oltrepò Pavese. The area cultivated with this variety has decreased significantly in the last decades, as has that used for viticulture destined for the production of red wines. In fact, even Croatina is less common although there has been less of a decrease, similar to Uva Rara (TABLE 4).

Besides Pinot Noir, discussed above, there has been a significant increase in the cultivation of Riesling and this now covers approximately 13% of vineyards. There has been a slight increase in Moscato, while figures for Cortese have remained unchanged. There is a current trend to favor planting species of wine destined for the production of white wines and sparkling wines *méthode traditionnelle*. If this continues, it is probable that by around the year 2000 wine production in the Oltrepò Pavese will be equally divided between red wines and white wines. However it should be noted that production of high quality red wines, that are already becoming known, will probably become much more widespread.

Different types of transformation of Pinot grapes and their use

Total annual production of grapevines in the Oltrepò Pavese for the two years under study was approximately 140,000 tons. The farms and wine producers in the study sample represent 28% (TABLE 6). The grapevines that could be used for sparkling wines *méthode traditionnelle* amounted to approximately 22-23% of the total study sample (TABLE 6).

From the estimates made (see above), approximately 23,000 tons/year was made up of Pinot Noir, Pinot Blanc and Pinot Gris, amounting to 16.4% of the entire production. However, on average, not all the grapes purchased were used to make wine, 5-6% of the total grapes that could be used to make sparkling wines *méthode traditionnelle* (TABLE 6).

If we consider the quantity of wine produced from grapes that could be used to make sparkling wines *méthode traditionnelle*, we can see the different use made of the grapes according to the sales objectives. Six classes of use were considered; wholesale (loose wine), carboy, still, sparkling (= semi sparkling = petillant = frizzante, low pressure < 2.5 bar), sparkling (high pressure >3.5 bar) Charmat (Methode "Charmat" = Metodo "Martinotti") and *méthode traditionnelle* (= Method Champenois = Metodo Classico). In the classes of sparkling, still, Charmat and *méthode traditionnelle* we considered the quantities of wine bottled and sold as more (sparkling) or less (still) lively white wine and as sparkling wines for fermentation in large containers (Martinotti or Charmat method) or in the bottle (*méthode traditionnelle* or metodo classico) (TABLE 8).

Table 8 shows that, for the two years under study, wholesale fell from 34.5% to 25.9% and sales of bottled wines it increases from 59% in 1987 to 67.5% in 1988.

The amounts of wine made according to the *méthode traditionnelle* it increase from the first to the second year from approximately 16% for the Charmats and approximately 12% for sparkling wines *méthode traditionnelle*. Sales of wine that can be made into sparkling wine *méthode traditionnelle* in carboy remained more or less unchanged at an average 6.6%.

Economic considerations concerning the different target markets chosen and added value

In order to estimate the cost-benefit to be obtained by the various choices of different possible enological transformation processes, the value in Italian liras of the different classes of product to be sold (wholesale, carboy, etc.) per hl of wine produced was evaluated in relation to the value of the fresh grapes (TABLE 9). On average, over the two years under study, the value of a hl sold wholesale was 144,400 It lire and 1,515,374 It lire if sold as sparkling wine *méthode traditionnelle*. It should also be noted that, while the price of the cheapest class of product from 1987 to 1988 increased by 16.17%, and for the sparkling wines *méthode traditionnelle* increased by 15.04%, the price of Charmat increased by only 4.5%.

Checking the percentage and partial progressions of the various increases in value summarized in Table 10 and Figure 1, we can see that, if we consider that the value of a hl of wine is equal to 1, in relation to the volume of wine yielded from the grapes, 1.36 is equal to the value of wine sold wholesale (sold loose). The value of wine sold in carboy is a little higher, while bottled wine is more than double (4.05), up to 6.04 if bottled as sparkling wine Charmat and 13.3 if bottled as sparkling wine *méthode traditionnelle*.

If we evaluate the added value as the percentage of growth with respect to the above formula we can see that the most consistent 'jump' was obtained in the phase from un-bottled wine (wholesale and demi-john) to bottled wine. The other clear increase is the 'jump' to sparkling wines *méthode traditionnelle*.

Given these last considerations, the points of excellence that can be identified differ according to the different costs of the production processes that the various farms and grapevine growers have to sustain and of the objectives which guide their business, be they strictly economical or related to marketing, as well as continuity and market presence. A further consideration comes from the fact that from the Pinot grapevine, for which there is no consumer demand, one passes to the bottle of *millésimé* and matured sparkling wine *méthode traditionnelle*, considered a luxury product. Between these two extremes one finds wine destined to be sold in demi-johns or what could be considered an 'ordinary' table wine. Summarizing the findings from the study data (FIGURE 1), it can be seen that the progressive grape processing stages correspond to an increasing added value that reach pre-determined values as one passes from one product category to another.

CONCLUSIONS

Our study shows some important characteristics of the vitiviniculture of the Oltrepò Pavese. In the D.O.C. area of the Oltrepò Pavese, to be found on the northern slopes of the northwestern Italian Apennines, vineyards cover just over 14,000 ha. There are few grapevine-growing fringes on the plains to the north of the D.O.C. area. Approximately 95% of the vineyards included in the towns and villages that can claim to use the denomination D.O.C. are on the national D.O.C. wine species register. Only approximately 40% of total production (approx. 900,000 hl, including also table wines and IGT wines, *Indicazione Geografica Tipica*), carries the D.O.C. label. However, the proportion of wine sold under D.O.C. labels has almost doubled in the last ten years.

A total of approximately 65% and 36% of the area is destined for the production of red and white wines, respectively. There has been a substantial increase in the importance of white wines in the last twenty years. Together the Pinots and Chardonnay cover over 3,000 Ha and probably more than

2,200 ha are used only for Pinot Noir, a variety that is, among the Pinots, increasingly more common. The area dedicated to Pinot Noir registered as D.O.C. has almost tripled in just over ten years.

The quantity of Pinot and Chardonnay grapevines processed in the Oltrepò Pavese amounts to around 80% of the total (*Associazione Produttori di Pinot*) and studies carried out have shown that approximately 50% of the wine obtained from these grapevines goes to produce sparkling wines *méthode traditionnelle* and the remainder is used in sparkling and still white wines (approx. 17%) or destined for sale in demi-johns and wholesale (approx. 36%). Little red wine is produced and Pinot Noir grapevines are not frequently used in other red D.O.C. wines. The Oltrepò Pavese, therefore, is the biggest producer of Pinot Noir for sparkling wines *méthode traditionnelle* in Italy and is one of the most important grapevine-growing areas for these wines in Europe and the world. Italy produces approximately 220 million bottles of sparkling wines of which only 18 million are produced according to the *méthode traditionnelle*. France produces 240 million bottles of Champagne out of a total of 330 million and Spain produces 100 million.

Most of the Italian production of sparkling wines *méthode traditionnelle* is, therefore, based on less noble and less suitable grapevines than Pinot Noir for the production of good or high quality wines. An analysis of the increases in value shown by wines produced from the Pinots in the study area identifies two important peaks in passing from wine sold unbottled to bottled wines, from Charmat to *méthode traditionnelle*. Furthermore, in the two years studied, a much greater increase was seen in the value of sparkling wines *méthode traditionnelle*. In fact, the production of wines according to the Charmat method only increased by 4% compared with the sparkling wines *méthode traditionnelle* that increased four times more (15.04%).

Today, there has been a substantial increase in the area dedicated to the cultivation of the most noble grapevine varieties destined for use in the production of sparkling wines *méthode traditionnelle* in the Oltrepò Pavese. This is to be considered in a national context in which less noble varieties than Pinot Noir form the basis of the production of sparkling wines *méthode traditionnelle*. In this context, the Oltrepò Pavese cannot compete with large companies who conduct strategies of competitive prices and wide distribution, and must, therefore, develop an approach based on product quality. Otherwise there is a risk of overproduction, even though the Oltrepò Pavese has a sort of 'exclusivity' in terms of quality production. It seems, therefore, essential to promote the study of the correct *terroir* for Pinot Noir and wine species for the production of sparkling wines *méthode traditionnelle* in general, with a further and constant improvement in the genetic material used and the cultivation and enological techniques adopted. This will ensure the highest quality standards of production. It will also, as far as possible, establish marketing strategies aimed at recognition of the quality of wine production in the area based on Pinot Noir. This may require strategies to protect the quality profile of the main species of wine of quality production of sparkling wines *méthode traditionnelle* in the world (Pinot and Chardonnay), names which are often used in contexts of sales and marketing that fall outside the D.O.C. denomination which guarantees them. A concerted effort seems, therefore, needed to find a point of reference within the D.O.C denomination. This will stimulate recognition in terms of product image, above all on the national market, and of the importance of Pinot Noir of the Oltrepò Pavese, a grape variety that represents a cornerstone of the production of high-quality Italian sparkling wines *méthode traditionnelle*.

We also need to encourage on a local scale a higher level of production and to discourage those wine producers who, although based on refermentation, attempt to market their products on the basis of competitive prices. Such an approach, being based on low prices and large quantities, would seriously compromise the development of the Oltrepò Pavese, an area characterized by medium-low production quantities and high management costs.

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Prove sperimentali sull'uso dell'elicottero nella difesa anticrittogamica della vite, secondo schemi di lotta guidata, anche con principi attivi endoterapici. Atti del 2 Convegno sulla Viticoltura dell'Oltrepò Pavese 27-28/02, Canneto Pavese (PV).

ZAMBONI M. (1988)

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Table 1 – The estimate of Pinot noir diffusion in the world (surface area, ha).

countries	Surface area (ha)
France	22,000 (Boursiquot, 1988)
Italy	4,000 ha (*)
West Germany	3,000 ha (Galet, 1985)
Switzerland	3,000 ha (Galet, 1985)
U. S. A.	3,000 ha (Galet, 1985)
Total	35,900 ha

(*) Census of agriculture (1982); Benetti, 1983; Dicorato, 1983; Iannini et al., 1985; Lechi, 1988; Denominazione di Origine Controllata - List of the Vineyards.

The grape-wine variety Pinot noir, is also present in: Argentina, Chile, Uruguay, Austria, Czechoslovakia, Hungary, Romania, Yugoslavia and Ex USSR.

Table 2 - The estimate of Pinot noir diffusion in the Italy (surface area, ha).

Italian regions	Surface area (ha)
Lombardia (<i>Oltrepò Pavese</i>)	2,500
Veneto (<i>East Provinces</i>)	1,100
Friuli Venezia Giulia	200
Trentino Alto Adige	230
Total	4,030 ha

Benetti, 1983; Dicorato, 1983; Iannini et al., 1985; Lechi, 1988; Denominazione di Origine Controllata - List of the Vineyards.

The grape-wine variety Pinot noir, is also present in the Regions: Piemonte and Emilia Romagna.

Table 3 – The enrolled surface (ha) to the D.O.C. (Denominazione di Origine Controllata) zone: *Oltrepò Pavese*, divided for different type of wine (vino).

<i>Vino</i>	1977	1988
BARBERA	1710	3090
BONARDA	1522	2363
ROSSO O.P.	2001	2038
BUTTAFUOCO	75	202
SANGUE DI G.	40	100
BARBACARLO*	38	-
CORTESE	50	116
RIESLING I.	730	1661
RIESLING R.	-	43
PINOT N.	906	2573
PINOT G.	153	
MOSCATO	690	1089
TOTALI	7762	13410

* Wine D.O.C. suppressed in 1984
It can be esteemed in 200-300 ha the presence of the variety Chardonnay, today authorized by the disciplinary of the DOC-Oltrepò Pavese.

Table 4 – The estimated surface (ha) of the different grapevine varieties in the Oltrepò Pavese D.O.C. (Denominazione di Origine Controllata) zone (1988) (from the data of Regione Lombardia).

Variety	ha	% of the Total surface	
		1988	1980
BARBERA	4419	33.0	44.3
CROATINA	2868	21.4	29.3
UVA RARA	507	3.8	5.3
PINOT N.	2166	16.2	5.8
PINOT G.	406	3.0	1.1
PINOT B.	136	1.0	-
RIESLING I.	1660	12.4	6.3
RIESLING R.	43	0.3	-
MOSCATO	1089	8.0	5.3
CORTESE	116	0.9	0.8
TOTALI	13410	100.0	98.2*

* 0,7% is the estimate for other varieties.

Table 5 – Number of farms and surface (ha) divided in the different Communes of the Oltrepò Pavese D.O.C. zone.

Communes	no. of farms				1982	
	1982	1970	dif.	Dif.%	surface (ha)	ha/farm
-						
BORGO PRIOLO	304	358	-54	-15.0	703.6	2.31
BORGORATTO M.	176	191	-15	-7.8	344.7	1.96
BOSNASCO	85	118	-33	-27.0	162.4	1.91
BRONI	442	564	-122	-21.0	363.7	0.82
CALVIGNANO	28	29	-1	-3.4	106.2	5.70
CANEVINO	49	57	-8	-14.0	152.9	3.10
CANNETO P.	358	462	-104	-22.0	458.9	1.30
CASTANA	261	266	-5	-1.8	275.6	1.10
CASTEGGIO	232	318	-86	-27.0	600.3	2.60
CECIMA	95	113	-18	-15.0	62.6	0.70
CIGOGNOLA	312	350	-38	10.0	541.5	1.70
CODEVILLA	205	287	-82	-28.0	593.3	2.90
CORVINO S.Q.	202	223	-21	-9.4	233.2	1.10
FORTUNAGO	121	166	-45	-27.0	99.8	0.80
GODIASCO	189	268	-79	-29.0	178.0	0.90
GOLFERENZO	94	105	-11	-10.0	172.0	1.80
LIRIO	54	66	-12	-18.0	180.0	3.30
MONTALTO P.	257	299	-42	-14.0	706.1	2.70
MONTEBELLO d.B.	140	227	-87	-38.0	195.6	1.40
MONTECALVO V.	126	208	-82	-39.0	558.2	4.40
MONTESCANO	88	118	-30	-25.0	144.1	1.60
MONTESEGALE	113	120	-75.8	89.1	0.80	
MONTÙ BECCARIA	544	632	-88	-13.0	1073.0	1.97
MORNICO LOSANA	209	283	-74	-26.0	379.5	1.80
OLIVA GESSI	46	63	-17	-26.0	136.8	3.00
PIETRA de' G.	292	338	-46	-13.0	498.7	1.70
PONTE NIZZA	148	183	-35	-19.0	62.6	0.40
REDAVALLE	134	180	-46	-25.0	221.1	1.60
RETORBIDO	198	291	-93	-31.0	169.1	0.80
RIVANAZZANO	162	309	-147	-47.0	200.0	1.20
ROCCA de' G.	46	62	-16	-25.0	246.4	5.40
ROCCA SUSELLA	96	109	-13	-11.0	86.5	0.90
ROVESCALA	316	383	-67	-17.0	561.9	1.80
RUINO	170	216	-46	21.0	230.6	1.40
S. DAMIANO	259	290	-31	-10.0	542.5	2.10
S. GIULETTA	208	269	-61	-22.0	273.2	1.30
S. MARIA d.V.	436	469	-33	-7.0	1011.1	2.30
STRADELLA	396	514	-118	-22.0	494.2	1.20
TORRAZZA C.	263	337	-74	-21.0	361.0	1.40
TORRICELLA V.	263	337	-74	-21.0	361.0	1.37
VOLPARA	54	66	-12	-18.0	111.3	2.10
ZENEVREDO	104	115	-11	-9.5	198.2	1.90
TOTALI	8275				14 944	

Table 6 – The grapevine yield in the farms studied (tons of grapes) and the quota for the sparkling wine.

year	Grapes production (t)	Grapes produced for sparkling wine		Grape for sparkling wine sold	
		t	% of the total one	t	% of the total one
1987	42,656.3	9,639.7	22.6	5,000	5.2
1988	36,781.1	8,240.2	22.4	5,000	6.1
Average	39,718.7	8,940.0	22.5	5,000	5.6

Table 7 – The sparkling wine production (hl of wine) in the farms studied.

year	Grape for sparkling wine used (harvested – sold) (t)	Sparkling Wine production (hl)
1987	9,139.7	5,223.6
1988	7,740.2	4,709.1
Average	8,440.0	4,966.4

Table 8 – The sparkling wine produced (hl) by the studied firms divided in the different type of sale. (“Trad.”= traditionnelle).

	Wholesale		carboy		sparkling		still		“Charmat”		“Trad.”	
	hl	%	hl	%	hl	%	hl	%	hl	%	hl	%
1987	18,037	34.5	3,403	6.5	3,425	6.6	4,800	9.2	16,287	31.2	6,284	12.0
1988	12,171	25.9	3,142	6.7	3,650	7.8	4,725	10.0	17,067	36.2	6,336	13.5
Average	15,104	30.2	3,272	6.6	3,537	7.2	4,726	9.6	16,677	33.7	6,310	12.7

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Table 9 – The evaluation in “Lire” of the different type of sale considered (“Trad.”= traditionnelle).

	Grapes (t)	Grapes Value (Millions of Liras/t)	Wholesale	carboy	sparkling	still	“Charmat”	“Trad.”
			Liras*1000/hl					
1987	7,307.1	1.043	133.6	165.0	458.8	536.4	734.8	1,409.8
1988	7,762.5	1.080	155.2	194.0	509.4	536.4	760.9	1,621.7
Av.	7,534.8	1,062	144.4	179.5	484,1	536.4	1,621.7	1,515.7

Table 10 – The percentage of the increase of wine value in the different type of sale (“Trad.”= traditionnelle).

	1987		1988		average	
Start value (Liras/hl)	104,382 Liras		108,023 Liras		106,102 Liras	
		<i>Cum</i>		<i>Cum</i>		<i>Cum</i>
Wholesale	+28.0	+28.0	+43.7	+43.7	+36.0	+36.0
Carboy	+23.5	+58.1	+25.0	+79.6	+24.3	+69.0
Sparkling	+178.1	+339.6	+162.6	+371.6	+170.0	+355.8
Still I	+16.9	+413.9	+5.3	+396.5	+10.8	+405.1
Still II	+225.1	+413.9	+176.5	+396.5	+198.8	+405.1
Charmat	+37.0	+604.0	+41.8	+604.4	+39.4	+604.2
Trad.	+91.9	+1,250.6	+113.1	+1,401.2	+102.7	+1,327.2

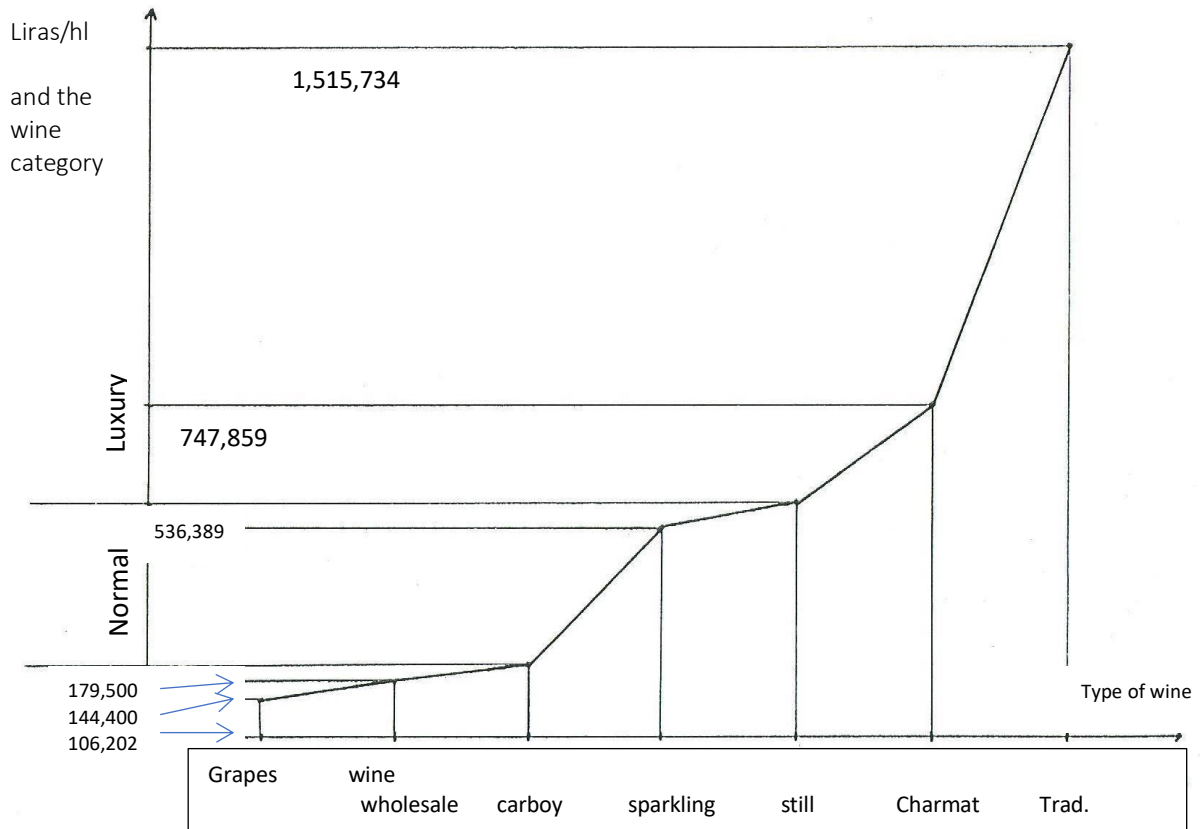


Figure 1 – The values (Liras /hl) in the different category of wine. (“Trad.”= traditionnelle).